

18. Discuss the principles and importance of Regioselectivity and Stereo selectivity in organic synthesis with examples.
19. (a) Discuss the Jablonski diagram and its significant role in understanding the photochemical processes.
(b) Describe the Paterno-Büchi reaction and its role in organic synthesis.
20. Elaborate the photochemical rearrangements using examples.
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NOVEMBER/DECEMBER 2025

**23PCH31 — ORGANIC SYNTHESIS AND
PHOTOCHEMISTRY**

Time : Three hours

Maximum : 75 marks



SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

Define yield in the context of chemical reactions.

2. Pen down any two pre requisite in planning an organic synthesis.
3. Prepare a note on monosubstituted cyclohexanes.
4. Name any two reagent that can be used to protect thiol groups.
5. Recall a [2+2] cycloaddition reaction with an example.
6. What is meant by FMO approach?
7. Provide an example of the Paterno-Büchi reaction.

8. Evaluate the factors influencing the Barton's reactions.
9. What is photon energy transfer in the context of photochemistry?
10. How does conjugated cyclohexadienone react to form 3,4-diphenyl phenols?

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Discuss the role of protecting groups in organic synthesis with examples.

Or

- (b) Explain the following with examples:
 - (i) Linear and convergent synthesis
 - (ii) Umpolung reaction

12. (a) Describe the various methods of protection and deprotection the hydroxyl groups with examples.

Or

- (b) Distinguish the bifunctional compounds from mono-functional compounds with suitable examples?

13. (a) Illustrate the [2+4] cycloaddition reaction with an example.

Or

- (b) Describe the Woodward-Hoffmann rules.

14. (a) Differentiate between Norrish Type-I and Norrish Type-II reactions with examples.

Or

- (b) Bring out the detailed significance of α, β -unsaturated ketones in photochemistry?

15. (a) Describe di- π -methane rearrangement with its applications.

Or

- (b) Explain Stern-Volmer equation.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Prepare a detailed report on the role of stereochemistry in organic synthesis with suitable examples.

17. Illustrate the protection and deprotection of amino group and carbonyl groups with examples.

